

AEDC

Arnold Engineering Development Center
Arnold Air Force Base, Tenn. 37389

An Air Force Materiel Command Test Facility

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Test Before Flight

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12V Space Chamber

The 12V Chamber is a 12-foot-diameter by 35-foot-high thermal vacuum test facility with solar simulation capability. The facility contains a full liquid nitrogen thermal shroud and has an optional gaseous helium inner liner that can be cooled down to 10 degrees Kelvin. The solar simulator is an off-axis system with xenon arc lamps that uses integrating assemblies to collimate a uniform, 1-solar constant beam over an 8-foot-diameter by 8-foot-high test volume. The chamber can also be configured for electric propulsion (EP) thruster plume analysis and integration effects testing.

Capabilities:

Thermal Control	Chamber is completely lined with a liquid nitrogen shroud that can provide thermal conditions down to 77 degrees Kelvin. Optional 10-degrees Kelvin gaseous helium liner available upon request.
Vacuum Range	$\leq 1 \times 10^{-7}$ Torr (with gaseous helium shroud) to local atmospheric pressure.
Working Volume	12-foot diameter x 35-foot high.
Pumping System	Mechanical roughing pumps, blowers, and single 36-inch diffusion pump, all with cryogenic traps. Upgrade to clean cryogenic high vacuum pumps planned.
Loading	Horizontal: 6-foot manway. Vertical: 10-foot cap at top of chamber.
Cold Wall	Full liquid nitrogen cryogenic shroud. Optional 10-degrees Kelvin gaseous helium liner available upon request.
Special Features	Quartz xenon arc lamp solar simulator system.
Data	All facility data time tagged and archived.
Work Areas	Test customer offices available. Limited hardware storage available.
Solar Simulation	Off-axis system with xenon arc lamps that use an integrating lens assembly to collimate a uniform, 1-solar constant beam over an 8-foot-diameter by 8-foot-high test volume.
Electric Propulsion	In the EP configuration, the cell pressure during thruster operation can be maintained at or below 10^{-6} Torr, with a xenon pumping speed exceeding 2,000,000 liters/sec. Plume Diagnostics with Langmuir Probes and Radio Frequency Horns are available.



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Photo # 67-163



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